

Remarks

Reconsideration and withdrawal of the objection and rejections set forth in the above-mentioned Official Action in view of the foregoing amendments and the following remarks are respectfully requested.

Claims 1-54 remain pending in the application, with Claims 1, 10, 12, 21, 23-27, 33, 37, 41, 47 and 51 being independent. Claims 12-24* and 41-54 have been withdrawn from consideration. Claims 1-4, 7-11 and 24-40 have been amended herein. The changes to the claims have been made mainly to improve their form and have not been made for reasons related to patentability. The additions to the preamble of independent Claims 1 and 25 have been made merely to provide a supplemental explanation of the usage of the term "raster".

Applicants again request that the restriction requirement be withdrawn. The Examiner noted that "[i]t is Applicants belief that some of the claims cannot be practiced by a cd recorder. Therefore, Applicant admits that some of the claims may be practiced by a cd recorder. Thus, the restriction is proper." However, in the Response to Restriction Requirement filed August 29, 2003, it was argued that "at least some of the claims cannot be reasonably be considered to be practiced in a cd recorder." (Emphasis added). It was never admitted that any of the claims could reasonably be considered to be practiced in a cd

*Claim 24 was not listed as being in the group of claims withdrawn from consideration or in the rejected claims. Nevertheless, Claim 24 was included in Group II in the restriction requirement in the Office Action dated July 29, 2003, and was not elected by Applicants in the Response to Restriction Requirement filed August 29, 2003. Accordingly, Claim 24 will be treated as being withdrawn for the purpose of this response, unless the restriction requirement is partially or wholly withdrawn for the reasons discussed above.

recorder. Claims 21, 24, 41, 47 and 51, for which specific reasons were given as to why they cannot reasonably be considered to be practiced in a cd recorder, should not be restricted and at least those claims and their respective dependent claims should be rejoined. Favorable consideration is requested.

Applicants note with appreciation the indication that Claims 5 and 6 recite allowable subject matter. These claims were objected to for being dependent upon rejected base claims. However, these claims will not be rewritten in independent form at this time because their respective independent claims are believed to be allowable for the reasons discussed below.

Applicants also note the Examiner's requests that a sworn English translation of the Japanese priority applications be submitted. It is respectfully submitted that because the claims are believed to be patentable over the applied citations for the reasons discussed below, sworn English translations should not be necessitated. Favorable consideration is requested.

Claims 1-4, 7-11 and 25-40 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 6,375,297 (Hayashi et al.). Claims 1-4, 7, 9 and 25 were rejected under § 102 as being anticipated by European Patent Application No. 0 895 869 (Shimada et al.). These rejections are respectfully traversed.

Hayashi et al. relates to a system for transmitting print data from a print controller to a printer. The print controller transmits to the printer information regarding a thickness of the printing medium prior to transmitting print data. A timing correction section corrects the timing of ink ejection in forward and reverse scans of the recording

head in accordance with the medium thickness information. Fig. 15 depicts an example of test patterns printed on a printing medium for detecting a correction quantity of ink ejection timing in a reverse scan with respect to the forward scan. Sub-pattern L1 is printed in the forward scan, while sub-pattern L2 is printed in the reverse scan. The proper ejection-timing correction quantity is determined by the test pattern in which the paired vertical bars are aligned with each other. In the example of Fig. 15, test pattern 4 corresponds to the proper correction quantity. Referring to Fig. 16 as described at col. 20, line 33 through col. 21, line 33, the ejection-timing correction quantities D_1 , D_2 are determined with regard to platen gaps P_1 , P_2 between the printhead and the printing medium, respectively. The mathematical expression from step S1006 of Fig. 16 is derived from this relationship between the gaps and correction values.

Applicants respectfully submit that the ejection timing correction values in a bi-directional printing mode correct the ejection timing of the printhead as a unit.

Applicants submit that Hayashi et al. does not disclose or suggest at least that rasters making up an image are divided into at least two raster groups and entering an adjustment value for print element drive timing between the at least two raster groups, as is recited in independent Claims 1 and 25.

Further, although Hayashi et al. claims correcting timing of ejecting ink droplets in accordance with information on a thickness of a printing medium, an ink ejecting velocity and a moving velocity of the recording head, Hayashi et al. is not believed to disclose or suggest the separate steps of at least entering an adjustment value for ink ejection timing determined from a plurality of adjustment patterns, storing the entered

adjustment value, and correcting the adjustment value according to a combination of the scan speed and a distance in performing a print operation, as is recited in independent Claims 10 and 26.

Regarding independent Claim 27, while Hayashi et al. describes storing means for storing a mathematical expression, the patent is not believed to disclose or suggest at least referring to first memory means in a printing apparatus storing first print position information associated with characteristic variations of the printing apparatus and second memory means in a print head storing second print position information associated with characteristic variations of the print head, and determining an adjustment value for adjusting the print position, based on the first and second print position information.

Hayashi et al. describes a temperature sensor 28 and the ejection-timing correction quantity D includes a component d3 temperature correction quantity. However, Hayashi et al. is not believed to disclose or suggest at least estimating an ejection speed of ink ejected from a print head based on a detected temperature and determining an adjustment value for adjusting the print positions based on the estimated ejection speed, as recited in independent Claim 33.

Nor is Hayashi et al. believed to disclose or suggest at least switching a drive frequency and a scan speed of a print head based on a detected temperature, estimating an ejection speed of ink ejected from the print head based on the detected temperature and determining an adjustment value for adjusting the print positions based on the estimated ejection speed and the scan speed, as is recited in independent Claim 37.

Thus, Hayashi et al. fails to disclose or suggest important features of the present invention recited in independent Claims 1, 10, 25-27, 33 and 37.

Shimada et al. relates to a method of printing a test pattern with a bidirectional printer in order to adjust print timing. As understood by Applicants, in Shimada et al. the print head has two rows of nozzles for each color ink, with each row forming different rasters. That is, the print head is capable of being divided into two raster groups. In Shimada et al., it was recognized that it is difficult with regard to conventional adjustment patterns in bi-directional recording as shown in Fig. 46 to recognize gaps between a line recorded in a forward scan and a line recorded in a reverse scan. That is, there is difficulty in visually observing the gaps in patterns (b), (c) and (d). Shimada et al. describes a structure to record patterns facilitating visual observation of a deviated print timing by an unevenness of color density as shown in Figs. 8-10. Applicants submit that although Shimada et al. teaches adjusting a print timing in bi-directional recording, there is no disclosure of adjusting a print timing between print elements divided into two raster groups. Regarding a print head having two columns of nozzles per color as in Fig. 5, for example, lines recorded by two rows of nozzles of section 64 form a straight line as illustrated in Fig. 6 and described at col. 14, lines 7-44. The driving timing of the two rows of nozzles is adjusted beforehand to assure this alignment.

Shimada et al. is not believed to disclose or suggest at least that rasters making up an image are divided into at least two raster groups according to a driving mode of a plurality of print elements, forming a plurality of adjustment patterns, in a manner that a print element drive timing between the at least two raster groups is shifted a

predetermined interval, and entering an adjustment value for the print element drive timing determined from the plurality of adjustment patterns, as is recited in independent Claims 1 and 25.

Thus, Shimada et al. also fails to disclose or suggest important features of the present invention recited in independent Claims 1 and 25.

Thus, independent Claims 1, 10, 25-27, 33 and 37 are patentable over the citations of record. Reconsideration and withdrawal of the § 102 rejections are respectfully requested.

For the foregoing reasons, Applicants respectfully submit that the present invention is patentably defined by independent Claims 1, 10, 25-27, 33 and 37. Dependent Claims 2-9, 11, 28-32, 34-36 and 38-40 are also allowable, in their own right, for defining features of the present invention in addition to those recited in their respective independent claims. Individual consideration of these dependent claims is requested.

Applicants submit that the present application is in condition for allowance. Favorable reconsideration, withdrawal of the objection and rejections set forth in the above-noted Office Action, and an early Notice of Allowance are requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Mark A. Willman", written over a horizontal line.

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